Letters to the Editor

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- Include no more than 500 words of text, three authors, and five references
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Acute postoperative lobar torsion associated with pulmonary arterial rupture

To the Editor:

We read with interest the review "Lobar Torsion After Pulmonary Resection: Presentation and Outcome."[1] Lobar torsion is indeed a rare complication of elective lobectomy. Most cases of lobar torsion manifest in a delayed fashion, often from pulmonary venous congestion, when the twisted lobes are often considered nonviable.[1,2]

In contrast to these studies, we report a case of pulmonary arterial rupture associated with acute postoperative lobar torsion. A 62-year-old man underwent elective left upper lobectomy for squamous cell carcinoma (pT2 N0) with routine division of the inferior pulmonary ligament. Surgery was unremarkable, and the patient was extubated in the operating room. On transfer to the recovery room, however, a dramatic increase in bleeding of more than 2 L from the underwater seal chest drains was noted, accompanied by systemic hypotension. The patient was reanesthetized, intubated, and transferred for emergency reopening of the thoracotomy. During thoracotomy, which revealed a significant volume of blood in the pleural cavity, the patient sustained a ventricular fibrillatory cardiac arrest. After the pericardium was opened, intracardiac adrenaline was administered, and internal cardiac massage and defibrillation were performed. Lobar torsion was diagnosed, with the diaphragmatic surface of the lower lobe facing in an anterosuperior orientation. A laceration at the junction of the main pulmonary artery with the apical branch of the lower lobe was detected, in keeping with the line of torsion. There had been no dissection around this branch at the initial operation. The laceration was repaired with 4-0 Prolene suture (Ethicon, Edinburgh, United Kingdom), and subsequent recovery was uneventful.

It had been our standard practice to divide the inferior pulmonary ligament during upper lobectomy. However, it is possible that this is more likely to allow torsion, in a similar manner to an unfixed middle lobe after right upper lobectomy.[3] We therefore changed practice after this event. We no longer divide the inferior pulmonary ligament during upper lobectomy, because, in theory, this could reduce the risk of torsion.[2] This would be difficult to prove, however, because of the rare occurrence of this complication. It is, however, interesting that there has been no increase in the incidence of problems as a result of a residual space in the apex of the pleural cavity, since this decision not to divide the inferior pulmonary ligament was taken. We are interested to hear the comments of other surgeons who may have seen cases of this previously unreported presentation of lobar torsion and would appreciate their views on division of the inferior pulmonary ligament.

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References

1. Cable DG, Deschamps C, Allen MS, Miller DL, Nichols FC, Trastek VF, et al. Lobar torsion after pulmonary resection: presentation and outcome. *J Thorac Cardiovasc Surg*. 2001;122:1091-3.
2. Wagner RB, Nesbitt JC. Pulmonary torsion and gangrene. *Chest Surg Clin North Am*. 1992;2:839-52.
3. Wong PS, Goldstraw P. Pulmonary torsion: a questionnaire survey and a survey of the literature. *Ann Thorac Surg*. 1992;54:286-8.
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Free right atrial patches for septal defect closure

To the Editor:

The article "Atrial Septum Around the Fossa Ovalis: An Ideal Patch for the Ventricular Septal Defect" by Yamagishi and colleagues[1] interested me for many reasons. Yamagishi and colleagues[1] are to be congratulated on their innovative tech-

nique. I have used the free right atrial patch for closure of atrial septal defects for 4 years now.[2] During a 6- to 36-month period of follow-up there has been no evidence of patch necrosis or residual shunt as a result of patch dehiscence. Evidence in 1 case suggests that the patch remains viable inside the atrium. Advantages are many. I have, however, not used this patch to close ventricular septal defects. I am not aware of any reports of a free atrial patch being used elsewhere in heart surgery.

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References

1. Yamagishi M, Shuntoh K, Takahashi A, Shinkawa T, Miyazaki T, Kitamura N. Atrial septum around the fossa ovalis: an ideal patch for the ventricular septal defect. *J Thorac Cardiovasc Surg*. 2002;123:999-1000.
2. Kumar AS, Choudhary SK, Ray R, Talwar S, Juneja R. Autologous right atrial patch for closure of atrial septal defect. *Indian Heart J*. 2002;54:289-91.

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Future technologic innovations for intraoperative visualization of native coronary artery and graft anastomoses

To the Editor:

We read with interest the article entitled "Epicardial 10-MHz Ultrasound in Off-Pump Coronary Bypass Surgery: A Clinical Feasibility Study Using a Minitransducer" by Eikelaar and associates[1] in the October 2002 issue of the Journal. Epicardial echocardiography for intraoperative assessment of native coronary artery and graft anastomosis is not a new approach, and many investigations related to the technique have already been performed in conventional coronary artery bypass grafting (CABG).[2] Although the use of off-pump CABG has been increasing recently, performance of the graft-to-coronary anastomosis is definitely more difficult during the off-pump CABG procedure than during conventional CABG. Epicardial echocardiography therefore appears to be more valuable and effective in off-pump CABG than in conventional CABG.

The echocardiographic equipment that Eikelaar and associates[1] used was described as a 10-MHz linear array color Doppler minitransducer (UST5531; Aloka Co, Tokyo, Japan). Its precise properties, however, are 5.0-MHz to 10.0-MHz in B-mode and 5.0-MHz to 7.5-MHz in color Doppler mode. It never works at 10-MHz in color Doppler mode, and the description in the article is thus somewhat confusing.

Although Eikelaar and associates[1] scanned the native coronary artery and graft anastomosis in B-mode and color Doppler mode, the vessels run parallel to the echocardiographic probe, which may result in underestimation of the real lumen or the quality of the anastomoses because of artifacts. Power Doppler mode, on the other hand, is efficient in visualizing coronary arteries.[3] Power Doppler ultrasonography is based on the total integrated power of the Doppler spectrum and has several advantages relative to conventional color Doppler echocardiography. It is more sensitive to visualization of smaller vessels, is angle independent, and does not produce signal aliasing. For those reasons we used the B-mode and power Doppler mode in our previous study.[4]

The transducer that we used was larger than their minitransducer, and its size limited the visualization of the posterior and inferior coronary arteries because of the restricted working space. Thus, although Eikelaar and associates[1] used it only for the bypass for the left anterior artery, it would be more effective for visualization of the posterior and inferior coronary arteries.

We have been developing two new types of echocardiographic probes and systems, in cooperation with the research laboratory of Aloka Co. One probe is a higher frequency echocardiographic probe (7.5-13.0 MHz in B-mode) measuring 16 $\times$ 6 $\times$ 9 mm, the same as the probe of Eikelaar and associates.[1] The high-frequency modality should enable more detailed visualization of the anatomy of the coronary artery and the quality of the graft anastomoses. The other probe is an original real-time 3-dimensional echocardiography system that reconstructs the power Doppler signals obtained from 2-dimensional image data into 3-dimensional image data sets.[5] The 2-dimensional imaging technique is time-consuming because all planes are not imaged simultaneously, and surgeons or sonographers require additional technical skills to acquire and evaluate the 2-dimensional images. Three-dimensional echocardiography is therefore expected to overcome these limitations of 2-dimensional echocardiography, although the time resolution to image distal anastomoses still needs to be improved.

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References

1. Eikelaar JH, Meijer R, Van Boven WJ, Klein P, Grundeman PF, Borst C. Epicardial 10-MHz ultrasound in off-pump coronary bypass surgery: a clinical feasibility study using a minitransducer. *J Thorac Cardiovasc Surg*. 2002;124:785-9.
2. Sahn DJ, Barratt-Boyes BG, Graham K, Kerr A, Roche A, Hill D, et al. Ultrasonic imaging of the coronary arteries in open-chest humans: evaluation of coronary atherosclerotic lesions during cardiac surgery. *Circulation*. 1982;66:1034-44.
3. Arruda AM, Dearani JA, Click RL, Ishikura F, Seward JB. Intraoperative application of power Doppler imaging: visualization of myocardial perfusion after anastomosis of left internal thoracic artery to left anterior descending coronary artery. *J Am Soc Echocardiogr*. 1999;12:650-4.
4. Suematsu Y, Takamoto S, Ohtsuka T. Intraoperative echocardiographic imaging of coronary arteries and graft anastomoses during coronary artery bypass grafting without cardiopulmonary bypass. *J Thorac Cardiovasc Surg*. 2001;122:1147-54.
5. Suematsu Y, Takamoto S, Ohtsuka T. Real-time three-dimensional echocardiography evaluation of graft anastomoses during coronary artery bypass grafting: preliminary experience. *Interactive Cardiovasc Thorac Surg*. 2002;1:52-4.

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Reply to the Editor:

We appreciate the letter by Suematsu and Takamoto in response to our work[1] and share their view[2] that the introduction of beating-heart coronary surgery[3] warrants a renewed look at the potential diagnostic merits and limitations of epicardial ultrasonography with a high-frequency minitransducer.[1,2,4] They are correct in delineating the frequency band of the Aloka minitransducer in greater detail in its B-mode and its color Doppler mode.

One important feature of this transducer is its small size (16 $\times$ 6 $\times$ 9 mm). It fits in between the suction pods of the Octopus stabilizer in both longitudinal and transverse directions.[1,4] The versatile transducer easily reaches the posterior and inferior coronary arteries (unpublished observa-